POSTER 4

Diversity of Volatile and Non-Volatile Compounds in a Gene Bank Collection of Cultivated *Daucus carota* L.

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Carrot roots and leaves contain various volatile and non-volatile metabolites such as carotenoids, sugars and terpenoids. While carotenoids especially beta-carotene has high beneficial effects on the human health (1,2,3), sugars and terpenoids contribute substantially to the pleasant taste and typical odour of carrot roots and leaves (4). To characterise the diversity of volatile compounds in carrot leaves and the occurrence of non-volatile compounds in carrot roots an association study was performed. Therefore, 104 different carrot genotypes were cultivated in the greenhouse for 100 days at controlled conditions. This material comprises a selection of *Daucus* genotypes from different gene banks representing all climates of *Daucus* cultivation. The material is composed of 18 modern varieties, 74 older varieties and 12 land races. For rapid analysis of non-volatile compounds, a fast sample preparation using accelerated solvent extraction (ASE) combined with a fast HPLC-DAD method was established according to earlier studies (5). For semi-quantitative analysis of the volatile compounds a rapid headspace-SPME-GC method was applied and a so-called “non-targeted data processing” based on pattern recognition was performed. On one hand this kind of analytical approach provides the possibility to cover the huge metabolic diversity in the plant material used and on the other hand high numbers of samples can be efficiently analysed. The statistical evaluation of volatile substances occurring in carrot leaves principally allows predicting various carrot quality parameters (e.g. presence and level of non-volatiles) of the related root. This opportunity is of great advantage for early single plant selection in breeding research and applied breading as well.

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